Adjustment:See fig. 14, first counter-clockwise rotate the lock ring to relax the T or R, then adjust its position till it focus the other half, at last clockwise fix the lock ring.

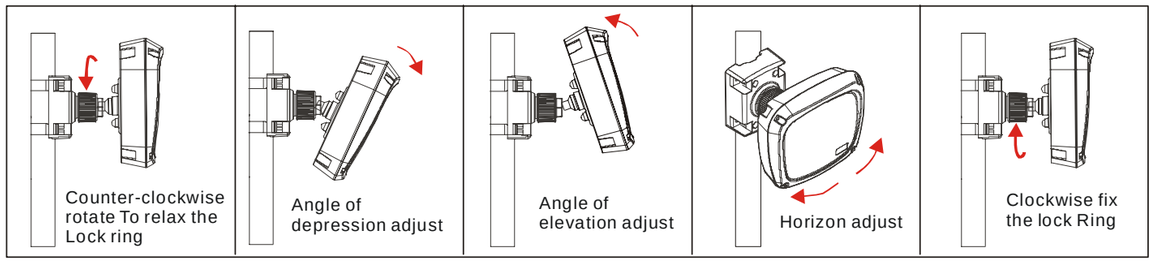


Fig 14

LED Status Instruction (see fig. 15):

Red LED (ALARM): Alarm status indicator, it will extinguish when there is no person walking or moving object in protected zone after adjustment. It will alarm and lit when detector finds person access the protected zone (the LED also lit even the T not focus to R).

Red LED (ALARM): Flashes, means voltage is low; flashes and 4 Green LED also lit, means weak signal.

Green LED (LEVEL): AGC (Auto Gain Control) circuit status indicator, the stronger signals it received, the more indicators extinguish. Detector is in max gain state when 4 Green LED lit. Even 4 Green LED all lit, the detector still works normally. The relationship between 4 Green LED and signal intensity is displayed by binary system (left to right): binary system, high order-low order; signal intensity, weak-strong.

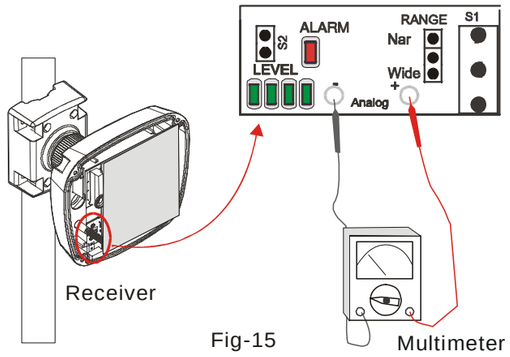


Fig-15

Adjust Procedure:

1. Refer to fig. 12～14 to make the R and T aligned.
2. Connect multimeter (set to DC 10V) to ANALOG Terminal of Receiver, make sure the polarity are correctly connected. See fig. 15.
3. Power-on when confirm there is no person walking or moving object in protected zone, wait 3 minutes until the detector from stand-by to working status.
4. Refer to fig. 14 to adjust and align the R&T, first try to extinguish the Green LED to the least, then make ANALOG output voltage reach max value (suggest adjust at least 1 Green LED extinguished)
5. Pull out the S2 Terminal to shut the indicator after adjustment.
6. Walk Test: Supply 10.5V/DC～24V/DC to system after adjusting the sensitivity; after 3-min warm-up time, do walk tests 5m away from T & R and in the middle of T & R respectively after ensuring that there is no person walking or moving object in protected zone.
7. Use wrench to fix the detector on the poles steadily.

Notice: The interval of each walk test is 20s, walk towards the base line of protected zone by 0.5～3m/s, 2m away from the protected zone after crossing. Test person weight 50～80kg, the height when person bows should be within 0.8～1m of the detector's installing height.

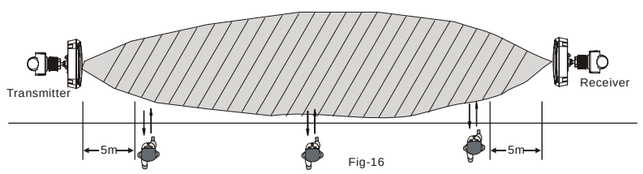


Fig-16

1. Walk Test should be performed, at least once a year, to guarantee proper operation and effective coverage of the detector.
2. Remote Control Test should be performed once a week.

The receiver will send the alarm signal to control panel and latter will alarm accordingly when making the walk test as fig. 16, the alarm signal of receiver lasts about 3s (Red LED lit lasts 3s).

Remote Control Test:

Connects a remote control testing button to control panel and provides a 5～12V DC to the TEST Terminal, it will output an alarm signal to the receiver when press the button, refer to fig. 11.

P/N: 980120M20001 Ver:1.0

M-200 Series Outdoor Microwave Barrier Installing Manual

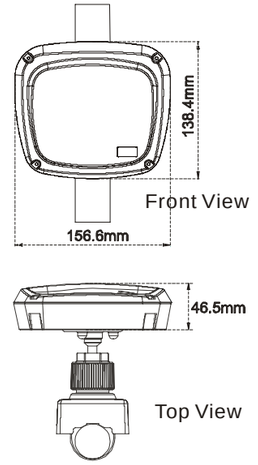
M-80/M-200/M-200MT is a bi-station microwave detector for outdoor application, it consists of transmitter (T) and receiver (R), and the detection range can reach max 228m. M-80/M-200/M-200MT microwave barrier comes with self-adapting circuit, which can effectively eliminate false alarms while maintaining high security standards for the detection of human intruders in the protected area.

Apply microwave modulating detection technology which owns high sensitivity of passive detection and low false alarm rate of active detection, it’s detection range is a three-dimensional protection zone. not just lines like beam sensor. It's very suitable for various complicated perimeter protection (like uneven ground environment etc), it can easily be installed on any type of fence or pole to provide a solid barrier protection and detect all possible perimeter intrusion. This barrier rejects interferences of small animals (like birds, cats) due to its original method of false alarm elimination.

Several M-200 systems can be combined to provide a complete perimeter protection with unlimited space or shape. The M-200 is designed for continuous round-the-clock operation and keeps working at a wide temperature range of -40℃up to +65℃ and max ambient humidity up to 100%.

Features:

- Microwave frequency: 9.5 /10.525 GHz
- Modulating frequency: 4 channels（for M-200MT）
- Sensitivity: High / Low 2 grades for option
- Max length of protection zone: M-80 outdoor 100m (330ft), M-200/M-200MT outdoor 228m(750ft)
- Max width of protection zone: About 2m (Nar), 3.5m (Wide)
- Max height of protection zone: About 2.5m (Nar), 4.5m (Wide)
- Working Temperature: - 40℃ ～ + 65℃
- Waterproof: IP65
- Power supply: 10.5V～24V / DC
- Electric current: ＜60mA, 12V DC (one set for M-200)
- Alarm Output: 3Sec, N.C 28VDC, 0.1A； N.C & N.O for M-200MT (Photo MOS Relay)
- Tamper output: N.C, 28V DC, Max 0.3A
- Response speed: 0.1m～10m/s (moving intruder speed)
- Ground unevenness: 0.3m
- Height of obstacles: Grass etc 0.3m, snow 0.5m
- Dimension: 156.6mm X 138.4mm X 46.5 mm
- Weight (per set): 1.1Kg



The installing site (see fig. 1)

Notice:

The protected zone must be free from obstacles of human-height trees and moving objects, the height of grass or bushes cannot exceed 0.3m.

- The snow depth cannot exceed 0.5m in winter. It is available to adjust the installing height of detector according to the snow depth; user has to take into account as detector cannot find intruder below the snow when its depth reaches 0.7m.
- The Detection Width (W) vary as practical Detection Length (L), max Detection Width of open area can be calculated by the formula:W= (1+L/80) m

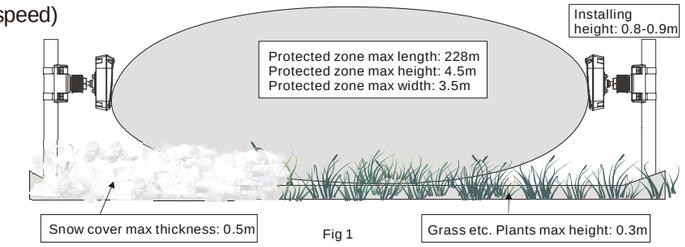
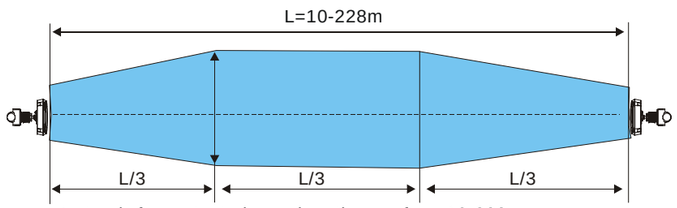


Fig 1



L stands for protected zone length, vary from 10-228m

（Fig 2）

Other notices:

- It is not supposed to have vehicles moving along with the protected zone within 2 meters or great woods grown nearby.
- Detector should be installed 3 meters away from highway or railway.
- be at least 20 meters away from 35KV High-voltage surge, 30 meters away from 500KV High-voltage surge, if detectors

installed parallel with High-voltage line, recommend installing the routing/wires under the ground or coupled with metal conduit tube.

◆ Detector should be installed in smooth face of constructions (fence or barrier), the unevenness within 0.3m, the distance from construction's top to detector should be within 0.6m-1.2m, and the jumping intrusion should be considered in practical installing. Also prevent installing near rainspout within 5 meters and signal-shield places (metals, steel, reinforced concrete etc.) ◆ If there's a narrow slit (width less 2m) in protected zone, it probably will shorten detection range, max 50% attenuation according to environment.

◆ **Warning:** Please do not press hard on the antenna's radiating surface in installing.

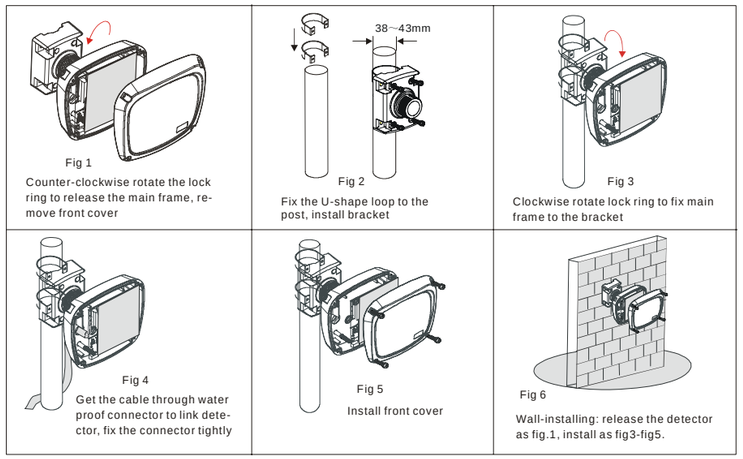
Installing Method:

1. U-shape fixed loop installing: for pole installation, use the metal material to build the installed poles, poles diameter: 38-43mm, refer to fig. 2 and fig. 3

Notice: The bottom of plastic housing should be 0.8-0.9m to the ground or grass (this is very important), and make sure the poles are fixed steadily and combine with components tightly.

2. Fixed installing, e.g. Wall-mount, referring to fig. 6

3. Fence/wall Top installing: If the detector is installed on top of fence/wall to prevent intrusion by climbing, the distance from installing bracket to fence's top cannot exceed 0.2m, the distance from detector to ground cannot exceed 2m, the max detection length cannot exceed 100m in this case; and make sure there isn't any fence/wall blocking the signal transmitting between T & R; when the detection area not cover the practical installing area, it is necessary to confirm the suitable installing site of T by TEST.



4. Ribbon Steel Installing: use ribbon steel to fix the device when post diameter more than 43mm (Ribbon Steel is optional components).

5. Cross and Overlap Installing:

In order to avoid "dead zones" of the perimeter, and to enlarge the protected area, recommend to install multiple M-200 systems work together by crossing or overlapping. The installing eliminates dead zones and guarantees system's availability and safety. See fig.6

Overlap installing requires the microwave barrier overlap with protected area at a suitable angle. The minimum overlap must exceed 1.5 ~ 2 m for effective coverage (depends on the sensitivity setting and installation height). The optimal way is to install transmitters (T) only or receivers (R) only at the point of overlap. See fig. 7

6. Channels Setting: Optional components, the microwave barrier works only when T&R are set in the same frequency, M200MT has 4 frequencies (CH1, CH2, CH3, CH4) for option, can be set by jumper, very easy to use. See fig. 9, 10.

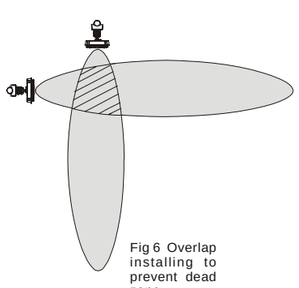


Fig 6 Overlap installing to prevent dead zone

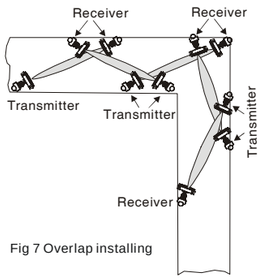


Fig 7 Overlap installing

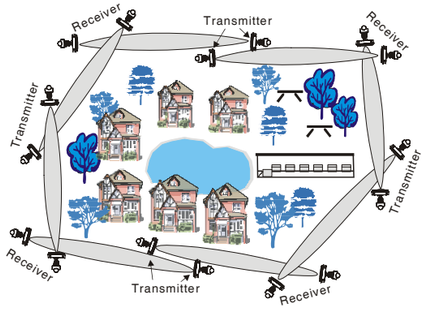


Fig 8 Enclosure space protection, paired overlaps

Advice: If customer using single-frequency

Microwave barriers (M-200/M-80) for cross or overlap installing, suggest to leave at least 30 degree when install 2 Receiver at the same location, it's to reach the best performance and prevent intereference of each other.

Wiring Instructions:

Refer to the chart below and confirm the wire's gauge used for one pair (Transmitter & Receiver), the distance is the farthest pair to the power supply. Divide the distance if apply several pairs of detector (Wiring distance divide pair NO.)

Transmitter wiring connection (as fig. 9):

V+&V- Terminals: Connect to power supply 10.5～12V / DC,

T1+&T2- Terminals: Connect T1&T2 Tamper terminals to a 24-hour protected zone of control panel, if the front cover of the detector is opened, an immediate alarm signal will be sent to the control panel.

TEST Terminal: TEST signal input terminal, detector will send an alarm signal when inputting a volt signal of +5～25V DC practically.

AWG	Max wiring distance			
	M-80		M-200	
	12VDC	24VDC	12VDC	24VDC
AWG22	200	900	180	730
AWG19	350	1700	300	1420
AWG17	500	2900	450	2580
AWG14	800	5000	700	4570

Receiver wiring connection (as fig. 10):

V+&V- Terminals: Connect V+&V- to power supply 10.5～24V / DC

Tamper Terminal: Connect Tamper Terminal to a 24-hour protected zone of control panel, if the front cover of the detector is opened, an immediate alarm signal will be sent to the control panel.

C ,NC&NO **Terminals:**Connect C,NC&NO (Alarm Output Terminal) with input terminal of panel

(notice: NO Terminal is optional output)

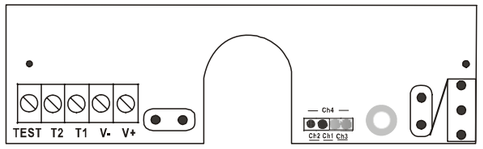


Fig 9 Transmitter connection

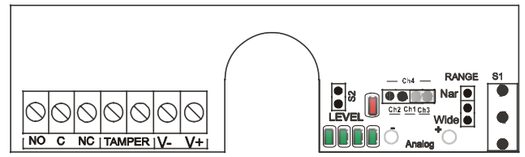
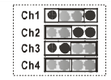
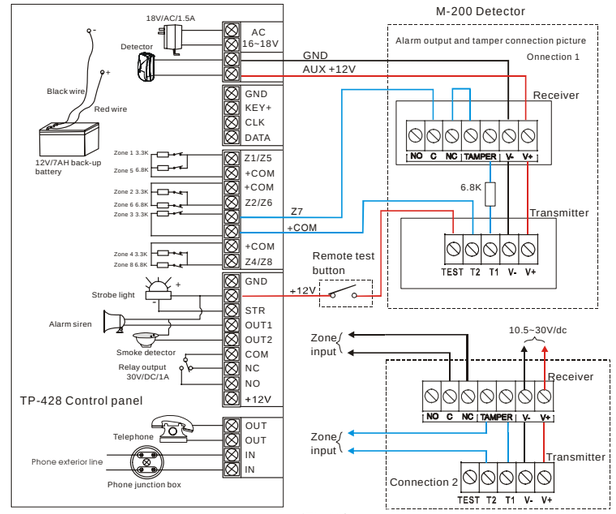


Fig 10 Receiver connection



Modulating Channels Setup (For M-200MT)

Control Panel Connection(Example TP-428 7th Zone)



（Fig 11）

Modulation:

After installation, adjust the receiver and transmitter to a face-to-face status. Make sure that the antenna's radiating surfaces of R and T are parallel (radiating surface is perpendicular to the virtual direct line). Fig. 12 is the correct installing height, fig. 13 is supposed to adjust the installing height.

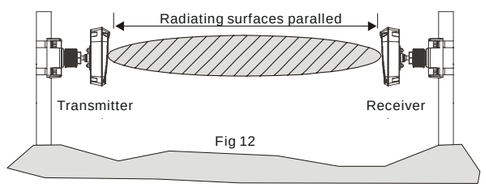


Fig 12

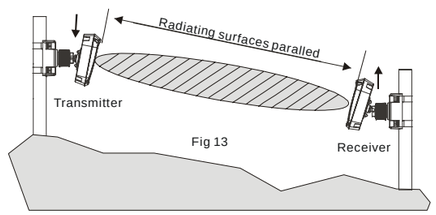


Fig 13